

(19) World Intellectual Property  
Organization  
International Bureau



22 FEB 2005



(43) International Publication Date  
8 January 2004 (08.01.2004)

PCT

(10) International Publication Number  
**WO 2004/003452 A1**

(51) International Patent Classification<sup>7</sup>: **F28D 9/00**,  
B01J 8/02, 19/00

(21) International Application Number:  
PCT/EP2003/005840

(22) International Filing Date: 4 June 2003 (04.06.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
02014422.6 28 June 2002 (28.06.2002) EP

(71) Applicant (for all designated States except US):  
METHANOL CASALE S.A. [CH/CH]; Via San Carlo  
22, CH-6932 Breganzona (CH).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **FILIPPI, Ermanno**

[IT/CH]; Strada di Gandria, 73, CH-6976 Castagnola (CH).  
**RIZZI, Enrico** [IT/IT]; Via Montale, 10, I-22070 Grandate (IT). **TAROZZO, Mirco** [IT/CH]; Via L. Piffaretti, CH-6853 Ligornetto (CH).

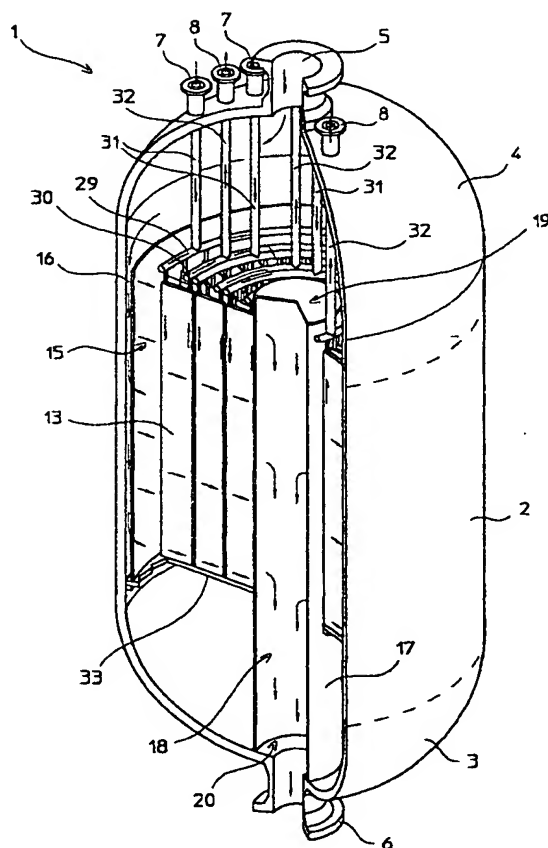
(74) Agent: **ZARDI, Marco**; M. Zardi & Co. S.A., Via Pioda 6, CH-6900 Lugano (CH).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),

[Continued on next page]

(54) Title: MULTISERVICE HEAT EXCHANGE UNIT



(57) Abstract: Heat exchange unit (1) of the so-called multiservice type comprising a substantially cylindrical shell (2) closed at the opposite ends by respective base plates (3,4), a plurality of heat exchangers (13) supported inside this shell (2) and in fluid communication with the outside thereof.

WO 2004/003452 A1

WO 2004/003452 A1



European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

**Published:**

— with international search report

# INTERNATIONAL SEARCH REPORT

International Application No  
PCT 03/05840

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 F28D9/00 B01J8/02 B01J19/00

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 F28D F28F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 1 153 653 A (METHANOL CASALE SA) 14 November 2001 (2001-11-14) column 5, line 6 - line 12 column 5, line 57 - column 6, line 29 column 6, line 56 - column 7, line 10 column 8, line 19 - line 49; figures 1-6	1-4, 7
Y		10-13
Y	FR 784 885 A (STUDIEN UND VERWERTUNGS GES M) 27 July 1935 (1935-07-27) page 1, line 1 - line 59; figures 1,2	10
Y	US 3 666 423 A (MUENGER JAMES R) 30 May 1972 (1972-05-30) column 4, line 49 - column 5, line 25; figures 1,5	11-13
	-/-	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

\* Special categories of cited documents:

\*A\* document defining the general state of the art which is not considered to be of particular relevance

\*E\* earlier document but published on or after the international filing date

\*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

\*O\* document referring to an oral disclosure, use, exhibition or other means

\*P\* document published prior to the international filing date but later than the priority date claimed

\*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

\*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

\*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

\*G\* document member of the same patent family

Date of the actual completion of the international search

14 October 2003

Date of mailing of the international search report

21/10/2003

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax (+31-70) 340-3016

Authorized officer

Beltzung, F

# INTERNATIONAL SEARCH REPORT

Application No  
PCT/EP 03/05840

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 100 31 347 A (BASF AG) 4 January 2001 (2001-01-04) column 6, line 45 - line 53 column 7, line 11 - line 41; figures 1-15	1-4,7
X	FR 2 771 802 A (DIETRICH & CIE DE) 4 June 1999 (1999-06-04) page 6, line 5 -page 8, line 25 page 10, line 14 -page 12, line 11; figures 1-24	1,5,6
A	US 5 035 867 A (DANG VU QUANG ET AL) 30 July 1991 (1991-07-30) column 1, line 54 -column 6, line 19; figures 1-4D	1
A	PATENT ABSTRACTS OF JAPAN vol. 013, no. 299 (M-847), 11 July 1989 (1989-07-11) -& JP 01 088099 A (HISAKA WORKS LTD), 3 April 1989 (1989-04-03) abstract	1
A	US 3 895 676 A (YOUNG RICHARD K) 22 July 1975 (1975-07-22) column 1, line 38 -column 3, line 8; figures 1-4	1,7-9

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/03/05840

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 1153653	A	14-11-2001	EP 1153653 A1	14-11-2001
			AU 6591701 A	20-11-2001
			BR 0110625 A	29-04-2003
			CN 1427741 T	02-07-2003
			WO 0185331 A1	15-11-2001
			EP 1284813 A1	26-02-2003
			US 2003175184 A1	18-09-2003
			US 2002018740 A1	14-02-2002
FR 784885	A	27-07-1935	NONE	
US 3666423	A	30-05-1972	US 3796547 A	12-03-1974
DE 10031347	A	04-01-2001	DE 10031347 A1	04-01-2001
			JP 2001038195 A	13-02-2001
FR 2771802	A	04-06-1999	FR 2771802 A1	04-06-1999
			DE 69803804 D1	21-03-2002
			DE 69803804 T2	22-08-2002
			EP 1036295 A1	20-09-2000
			WO 9928691 A1	10-06-1999
			JP 2001525532 T	11-12-2001
			US 6460614 B1	08-10-2002
US 5035867	A	30-07-1991	FR 2625692 A1	13-07-1989
			AT 76330 T	15-06-1992
			CA 1335753 C	06-06-1995
			DE 68901535 D1	25-06-1992
			EP 0324670 A1	19-07-1989
			JP 1230989 A	14-09-1989
			JP 2745140 B2	28-04-1998
JP 01088099	A	03-04-1989	JP 1834043 C	29-03-1994
US 3895676	A	22-07-1975	NONE	

**THIS PAGE BLANK (USPTO)**